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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,576	10/31/2003	Sara A. Kerner	070602-0400	1577

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EXAMINER

PATEL, SHAMBHAVI K

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2128

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/699,576	Applicant(s) KERNER ET AL.	
	Examiner Shambhavi Patel	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **19 December 2007** has been entered.
2. Claims 1-28 have been presented for examination.

Response to Arguments

3. In view of Applicant's amendments, the prior art rejections of claims 15-28 have been withdrawn.
4. Applicant's arguments with respect to claims 1-14 have been considered but are not persuasive.
 - i. **Applicants submit**, on page 15 of the remarks, that Ralston does not disclose the amended limitations, including a space system model.

Examiner notes that the term "space system" is a vague term that is not defined by the specification. The specification states that as an example, the system being modeled can be that of the earth and the surrounding satellites. However, the limitations do not require this specific model—the claims state that satellite model status data and a space system model must be included in the system. The environment modeled by Ralston is interpreted to be analogous to the space system in the claim limitations. Ralston discloses a visualization system or method for developing a space system utilizing a space system model of the virtual world (**figure 9**) and a representation of satellite model status data where the representation includes satellite orbit ([0090]-[0091] **satellite data, including the direction of its movement**). Ralston discloses the above system and method where a viewer can select a satellite to view its satellite model status data ([0090]-[0091]) and direct the satellite to move to a different position ([0061] **discloses the moving of virtual objects, which include satellites [0090]**).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding **claims 1, 8, 15 and 27**, the terms “satellite model status data”, “space system” and “space system model” are indefinite. Claims 1 and 8 recite possible representations of the status data, but it is unclear how this data is obtained. Is this empirical data? Claims 15 and 27 do not define the term nor do they clarify how the data is obtained. The claims do not explicitly recite the inclusion of a satellite model in either the virtual or real world, but they recite satellite model status data. It is unclear which satellites the status data are referring to. Regarding **claim 1**, the limitation “an output portion...configured to allow the viewer to develop a space system” is indefinite. If this is an output portion, how can it be used to allow the user to develop the system? Regarding **claim 8**, the limitation “developing a space system” is indefinite. What does this entail? How is it different from the space system model that is determined earlier in the claim? Regarding **claim 15**, the first limitation indicates that the virtual world that is displayed to the user already includes satellite model status data, but the subsequent limitation recites “selecting a satellite, by the viewer, to view satellite model status data of the satellite.” Is this status data different from the previously presented status data? Examiner notes that while “satellite model status data” is included in the representation, the satellites themselves are not necessarily included. Thus, there is no antecedent basis for the selecting and directing of satellites. The phrases “selecting a satellite, by the viewer” and “directing the satellite, by the viewer” are indefinite. Regarding **claim 27**, the third limitation indicates that the virtual world that is displayed to the user already includes satellite model status data, but the subsequent limitation recites “allow the viewer to select a satellite to view satellite model status data of the satellite” Is this status data different from the previously presented status data? Examiner notes that while “satellite model status data” is included in the representation, the satellites themselves are not necessarily included. Thus, there is not antecedent basis for the selecting and directing of satellites. The limitation “an output portion...configured to allow the viewer to develop a space system” is

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indefinite. If this is an output portion, how can it be used to allow the user to develop the system? All other claims are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 1-7 and 27-28 are rejected under 35 U.S.C. 101** because the claimed invention is directed to non-statutory subject matter. Regarding **claims 1 and 27**, the claims are directed to a system, but appear to be comprised solely of software elements. All other claims are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language

7. **Claims 1, 3-5, 7-9, 10-12, 14-15, 17-18, 21-25 and 27-28 are rejected under 35 U.S.C. 102(e)** as being clearly anticipated by **Ralston (US Pub. No. 2003/0014212)**.

Regarding claims 1 and 27:

Ralston discloses a visualization system for developing a space system (the environment modeled by Ralston is interpreted to be analogous to the space system in the claim limitations) comprising:

- a. a positioning portion (**figure 4a head position 405 renderer 400; [0057]**) configured to determine a position of a viewer with respect to a real world (**figure 7; [0068]**) and a position of the viewer with respect to a virtual world (**figure 8; [0070]**), the positioning portion configured to allow the viewer to interact with the virtual world (**figure 14; [0076]**)

- b. a modeling portion configured to specify the virtual world in response to a space system model of the virtual world (**figure 1 renderer 400; [0057]**)
- c. a model specification portion configured to specify a representation of satellite status data in response to the position of the viewer with respect to the virtual world and in response to the satellite status data (**figure 25; [0090]-[0091]**)
- d. an output portion configured to provide an image of the virtual super-imposed on an image of the real world (**figure 25**), and configured to allow the view to develop a pace system (**[0061]; [0076] can alter the location of virtual objects**), the image of the virtual world including the representation of the satellite model status data to the viewer in response to the position of the viewer with respect to the virtual world (**figure 25; [0090]-[0091]; figure 27 output to 465**)
- e. wherein the representation of the satellite data comprises a representation of the satellite orbit. (**[0090] direction satellite is moving in**).

Regarding claim 27, the “object” in this claim is equivalent to the “satellite” in claim 1. **Ralston discloses** an input portion configured to allow the viewer to select a satellite to view satellite model status data of the satellite (**[0090]-[0091] viewer can choose to view satellites and data**) and configured to allow the viewer to direct the satellite to move to a different position (**[0061] discloses the moving of virtual objects, which include satellites [0090]**).

Regarding claims 3 and 10:

Ralston discloses the visualization system of claim 1 wherein the model of the virtual world is a multi-dimensional model of the virtual world (**[0100]**), and the output portion in a multi-dimensional output portion (**[0062] real-world output presented in form of see through glasses, which is 3D**).

Regarding claims 4, 11, 17 and 28:

Ralston discloses the visualization system of claim 1 wherein the representation of the satellite model status data comprises a representation of the current position (**figure 25; [0038]**).

Regarding claims 5, 12 and 18:

Ralston discloses the visualization system of claim 1 wherein the three-dimensional output portion comprises a heads-up pair of glasses (**figure 4B headset 465; [0058]; figure 9; [0071]**).

Regarding claims 7 and 14:

Ralston discloses the visualization system of claim 5 wherein the heads-up pair of glasses area also configured to allow the viewer to view the image of the virtual world super-imposed on the image of the real world (**[0057] real world field of view augmented with virtual objects**).

Regarding claim 8:

Ralston discloses a method for visualization of augmented reality to develop a space system, the method comprising:

- a. determine a position of a viewer with respect to a real world (**figure 7; [0068]**) and a position of the viewer with respect to a virtual world (**figure 8; [0070]**), the positioning portion configured to allow the viewer to interact with the virtual world (**figure 14; [0076]**)
- b. determining a space system model of the virtual world (**figure 7 steps 720 and 725**). The environment modeled by Ralston is interpreted to be analogous to the space system in the claim limitations.
- c. specify a representation of satellite model status data in response to the position of the viewer with respect to the virtual world and in response to the satellite model status data (**figure 25; [0090]-[0091]**)
- d. displaying to the viewer a representation of the virtual world super-imposed on a representation of the real world (**[0057] real world field of view augmented with virtual objects**), the representation of the virtual world including the representation of the satellite status data in response to the position of the viewer with respect to the virtual world (**figure 25; [0090]-[0091]**).
- e. developing a space system (**[0090]-[0091]**). This is interpreted to be analogous to the final model that is rendered and displayed to the user.

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- f. wherein the representation of the satellite data comprises a representation of the satellite orbit ([0090] direction satellite is moving in).

Regarding claim 15:

Ralston discloses a visualization method for developing a space system (the environment modeled by Ralston is interpreted to be analogous to the space system in the claim limitations) comprising:

- a. displaying to a viewer a representation of a real world overlaid with a representation of a virtual world ([0057] real world field of view augmented with virtual objects), the representation of the virtual world including the representation of the satellite model status data (figure 25; [0090]-[0091]).
- b. selecting a satellite, by the viewer, to view satellite model status data of the satellite ([0090]-[0091] operator can choose to view satellites and their status data)
- c. directing the satellite, by the viewer, to move to a different position ([0061] discloses the moving of virtual objects, which include satellites [0090])
- d. wherein the representation of the virtual world is determined in response to a space system model of the virtual world (figure 7 steps 720 and 725) and in response to a position of the viewer with respect to the virtual world (figure 7; [0068]; figure 8; [0070]).
- e. wherein the representation of the satellite model status data is determined in response to satellite model status data, and in response to a position of the viewer with respect to the virtual world (figure 25; [0090]-[0091]).
- f. wherein the viewer is allowed to interact with the virtual world (figure 14; [0076])

Regarding claims 21-23:

Ralston discloses providing the representation of the real world and the virtual world (and super-imposing the virtual world on the real world) in real time ([0055]; [0057]).

Regarding claim 24:

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Ralston discloses allowing the viewer to select a satellite or geographic area ([0091]).

Regarding claim 25:

Ralston discloses allowing the viewer to directly select and manipulate objects in the virtual world without using a mouse ([0061]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 2, 6, 9, 13, 16, 19, 20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ralston (US Pub. No. 2003/0014212) in view of Kato ("Virtual Object Manipulation on a Table-Top AR Environment", 2000).

Regarding claims 2, 9 and 16:

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Ralston does not explicitly disclose the use of pre-determined markers in the real world. Kato teaches an augmented reality system including:

- a. an image acquisition source configured to capture at least an image comprising an image of the real world (**Kato: section 3 4th paragraph “users...see the real world through the video camera; section 4.1), and an image of at least a pre-determined marker positioned in the real world (Kato: section 3 4th-5th paragraphs: real cards labeled with tracking markers, and computer vision techniques are used to find the tracking mark)**
- b. an image processing portion configured to determine the position of the viewer with respect to the read world in response to the image of the pre-determined marker (**s Kato: section 3 4th paragraph determine the exact pose of the head mounted camera relative to the tracker; section 4.1)**
- c. virtual positioning portion configured to translate the position of the viewer in the real world to the position of the viewer in the virtual world (**Kato: section 3 4th paragraph once the position of the real camera is known, virtual image can be exactly overlaid on it; section 4.1)**

At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Ralston and Kato because the interface of Kato provides accurate tracking and registration techniques and an intuitive and useful interface (**Kato: abstract**).

Regarding claims 6 and 13:

Kato teaches the visualization system of claim 2 wherein the image acquisition source (a video camera) is physically coupled to the heads-up pair of glasses (section 3 1st paragraph “people...wear Olympus HMDs with cameras attached”).

Regarding claim 19:

Ralston does not explicitly disclose the use of pre-determined markers in the real world. Kato teaches an augmented reality system including displaying to the viewer a portion of the virtual selected by the viewer wherein the viewer selection is determined in response to a position of the a viewer-controlled marker with respect to the

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virtual world, wherein the marker is positioned in the real world (**Kato: section 3**). At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Ralston and Kato because the interface of Kato provides accurate tracking and registration techniques and an intuitive and useful interface (**Kato: abstract**).

Regarding claim 20:

Kato discloses the visualization method of claim 19, wherein the step of displaying to the viewer the portion of the virtual world selected by the viewer comprises overlaying an icon over the portion of the virtual world displayed to the viewer (**Kato: section 3**).

Regarding claim 26:

Ralston does not explicitly disclose the use of pre-determined markers in the real world. **Kato** teaches an augmented reality system including a marker positioned in the real world, the marker is static or placed upon a paddle that included a pre-defined visual marker in the real world, and the paddle is capable of being moved around the real world (**Kato: sections 3 and 4**). At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Ralston and Kato because the interface of Kato provides accurate tracking and registration techniques and an intuitive and useful interface (**Kato: abstract**).

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Conclusion

9. **Examiner's Remarks:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP


KAMINI SHAH
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